



Nonstructural Frequently Asked Questions

CPRA Flood Risk and Resilience Program

This document compiles Frequently Asked Questions that pertain to CPRA's Flood Risk and Resilience Program and the nonstructural project recommendations developed for the 2017 Coastal Master Plan. The intent is to provide interested coastal Louisiana residents, parish officials, coastal stakeholders, and the general public with additional information about CPRA's nonstructural projects and related programmatic and policy initiatives. The FAQs cover a range of topics, from general information to more technical details of the analysis, in order to be of use to a wide range of audiences. To help users navigate the information, this document is organized into the following sections:

- General Information about the Flood Risk and Resilience Program
- Overview of Nonstructural Projects
- Master Plan Analysis and Development of Nonstructural Projects
- Property Owner Questions
- Flood Risk and Resilience Program Policy Questions

These FAQs will also be updated with additional information as the master plan progresses and nonstructural project recommendations are finalized.

General Information about the Flood Risk and Resilience Program

1. What is CPRA's Flood Risk and Resilience Program?

CPRA's Flood Risk and Resilience Program is focused on promoting the state's objective of reducing the impacts on communities of coastal storm surge based flooding. The program emphasizes the planning for and implementation of nonstructural projects, which are complements to the other structural risk reduction measures such as levees and flood gates. Nonstructural risk reduction measures include activities that do not stop floodwaters, but reduce the impacts of flooding to buildings and infrastructure by floodproofing, elevation, or voluntary acquisition where property owners move away from high risk areas. Additionally, the Flood Risk and Resilience Program also supports other programmatic efforts and resilience policies to reduce risk to future building infrastructure, promote safer growth, and to encourage greater flood risk awareness.

2. What is unique about the Flood Risk and Resilience Program?

CPRA is utilizing the best available science and lessons learned from other mitigation programs to create a coast wide nonstructural program that effectively reduces flood risk and meets the needs of coastal residents. This process enables wise use of resources while trying to meet the needs of the communities most vulnerable to flood damage because they are either located in areas of high risk or they may not have the economic resources to prepare for or recover from a storm surge event. The program is also designed to adaptively respond to local needs by enabling parishes to further develop and refine nonstructural projects. Unique in scope, while building off the many





ongoing mitigation successes, the Flood Risk and Resilience Program offers substantial benefits such as:

- **Reduced cost share requirements** as compared to federal programs: 90% CPRA funded with up to 100% full state funding when certain requirements are met
- **Promotes implementation of large-scale nonstructural projects** (i.e., 100-6,000+ structures) to take advantage of economy of scale
- Supports local decision making through parish prioritization of structures to be mitigated
- **Promotes higher standards** of risk reduction by elevating residential structures to CPRA 100-year flood depths (above grade) plus two feet

3. What are the major improvements to the nonstructural program for the 2017 Coastal Master Plan?

The Flood Risk and Resilience Program has advanced by:

- Developing a framework and nonstructural application process to set in place the institutional mechanism to distribute funding to parishes
- Furthering state and local planning and coordination by establishing consistent dialogue between CPRA, other state agencies, and parishes throughout program development process
- Refining recommended nonstructural measures (floodproofing, elevation, voluntary acquisition) to better consider local needs and technical feasibility
- Refining nonstructural project areas to better reflect local jurisdictions and areas of high risk

The 2017 flood risk analysis has improved through:

- Expanding the model boundary to account for a growing floodplain
- Increasing spatial resolution of the flood risk model grid (1 km² grid cell or smaller census block) to allow for more detailed analysis of flood risk, especially in rural areas
- Improving the inventory of coastal assets at risk through more current and robust datasets
- Additional improvements include: incorporating recent levee system research into system fragility scenarios, incorporating parametric uncertainty into flood depth estimates, and comparing the Coastal Louisiana Risk Assessment (CLARA) model flood depth and damage estimates to those observed during Hurricane Isaac for verification purposes

The program works to respond to community concerns and changing community needs by:

- Incorporating social vulnerability by emphasizing that low to moderate income (LMI)
 households be prioritized during the nonstructural application process and the parishes'
 implementation of nonstructural projects
- Incorporating future economic growth scenarios by varying several factors including rates of population growth/decline, changes in future flood depths and land loss over time due to relative sea level rise to better determine future vulnerabilities

4. Is there currently funding available from CPRA to implement nonstructural mitigation projects?

There is not yet funding allocated to CPRA's Flood Risk and Resilience Program. CPRA's overall goal is to effectively utilize different funding sources as they become available to reduce risk and to





effectively implement the nonstructural projects identified in the 2017 Coastal Master Plan. While there is still significant uncertainty in the total funding amount and timing, this funding will likely come from several existing and potential future sources. Potential and existing funding sources that could be used for nonstructural project implementation include the Gulf of Mexico Energy and Security Act (GOMESA), and the Title VII Water Resource Development Act (WDRA)/ Energy and Water Appropriation Act.

Should funds become available for the Flood Risk and Resilience Program, CPRA will work with the CPRA Board's Flood Risk and Resilience Subcommittee to review and approve project applications based on the criteria outlined in the Flood Risk and Resilience Program Framework and Parish Applicant's Handbook. These projects would be identified in future Annual Plans.

5. Is there a list of structures recommended for nonstructural mitigation? How do I get on the list?

CPRA does not have a list of specific structures recommended for mitigation or that qualify for nonstructural funding. The 2017 Coastal Master Plan's nonstructural recommendations are meant to be for coast wide planning purposes based on estimates of how many structures are in a given project area and the flood depths in that project area. These project locations will be further examined by parishes and local officials for the implementation of elevation, floodproofing, and/or voluntary acquisition for particular structures.

6. Does CPRA communicate and collaborate with communities? How is CPRA getting the word out?

CPRA welcomes feedback from coastal communities and stakeholders and has established several stakeholder groups to hold ongoing conversations as the master plan is developed. Additionally, CPRA held a series of community meetings in February - March of 2015, February of 2016, and October of 2016. The draft plan will be released in January of 2017 when additional meetings will be held to gather feedback before the plan is submitted to the Louisiana State Legislature in April 2017.

CPRA has also enlisted community members and coastal stakeholders to provide input into the Flood Risk and Resilience Program and the broader 2017 Coastal Master Plan including:

- The **Community Focus Group** provides feedback on how the master plan may be able to better address communities' needs. Comprised of community advocates and organizers, faith-based groups, and tribal leaders, the group is charged with enhancing and expanding ongoing communications between the state and local coastal citizens.
- The **Parish Floodplain Manager's Group** offers insight into the implementation of nonstructural projects, including expertise in grant applications, funding procurement, and project implementation. These professionals consist of local parish floodplain managers, grant administrators, state hazard mitigation staff, and parish planners. They also offer experience in broader planning efforts for reducing flood risk and promoting safer community development such as the development of local plans and ordinances, as well as local management of NFIP's Community Rating System.
- The **Flood Risk and Resilience Stakeholder Group** consists of NGOs and other stakeholders who are convened periodically to provide feedback on the Flood Risk and Resilience Program developments and anticipated path forward.

CPRA convenes additional working groups as needed to further other targeted initiatives. One such example is the workgroup that developed the Master Plan Data Viewer and provided input on the development of the online, interactive flood risk visualization tool. This workgroup





consisted of a variety of community advocates, faith-based groups and NGOs, as well as a range of flood risk and outreach/education practitioners.

7. How do I get updates on CPRA's Flood Risk and Resilience Program? How can I get informed on the program or the projects being recommended in my area?

- To explore 2012 Coastal Master Plan data or projects in your area, please look at our Master Plan Data Viewer: http://cims.coastal.louisiana.gov/floodrisk/
 - Please note, 2017 Coastal Master Plan data and projects will be available here in early 2017
- For an overview of the Flood Risk and Resilience Program and more resources, please visit our webpage: http://coastal.la.gov/a-common-vision/2017-master-plan-update/ccrp/
- For updates on the nonstructural projects, the 2017 Coastal Master Plan, or other CPRA work, sign up for emails: http://coastal.la.gov

Overview of Nonstructural Projects

8. What types of projects are considered for nonstructural mitigation? How are these nonstructural projects defined?

Nonstructural projects in the 2017 Coastal Master Plan include one or more of the following mitigation measures, which are defined according to structure types and mitigation standards. The below mitigation standards correspond to CPRA 100-year flood depths that the nonstructural measures are designed to mitigate (plus two feet of required freeboard for elevation projects) for either year 10 or year 25 future flood depth conditions.

The 2017 Coastal Master Plan considers three types of mitigation measures including:

- **Floodproofing** of non-residential structures is recommended in areas where the mitigation standard is less than three feet above grade
- **Elevation** of residential structures is recommended in areas where the mitigation standard is between 3-14 feet above grade
- **Voluntary acquisition** for residential structures is recommended in areas where the mitigation standard is greater than 14 feet above grade

Thus, if an area experiences six feet of future flooding, residential structures are proposed to be elevated to eight feet in order to account for the required two feet of freeboard. Similarly, an area that experiences thirteen feet of flooding would be eligible for voluntary acquisition, as structures would need to be elevated greater than 14 feet in order to account for two feet of required freeboard. Lastly, the elevation heights will also conform to the federal standards (Executive Order 13690) of requiring elevation to the locally adopted or advisory FEMA Base Flood Elevation (BFE) plus two feet of freeboard (at a minimum).

Nonstructural projects proposed for the initial implementation time period (year 1-30) are defined by 100-year future flood depths for year 10 under the High environmental scenario; nonstructural projects proposed for the later implementation period (year 31-50) are defined by 100-year future flood depths for year 25 under the High environmental scenario (see FAQ #16 for more information about environmental scenarios).

9. If I live in an area with a recommended elevation project, can I be considered for a voluntary acquisition instead?

The Flood Risk and Resilience Program is designed to flexibly meet homeowner and overall community needs. If your home is located in an area recommended for elevation, you may discuss





the option of voluntary acquisition with your parish floodplain manager. The 2017 Coastal Master Plan nonstructural projects are designed to provide a high-level recommendation of total potential costs, number of structures that could be mitigated, and timeline for implementation to parishes who then refine the project based on location specific details, homeowner interest, contractor bids, or other local priorities.

10. Why is 14 feet the limit for residential elevation?

The 14 foot maximum elevation height is a recommendation of the United States Army Corps of Engineers (USACE) National Nonstructural/ Flood Proofing Committee. Based on engineering knowledge and professional floodplain management best practices, this maximum is a prudent limit that avoids introducing significant hazards to the structure from tropical wind speed. From an engineering standpoint, higher elevations can be achieved, but not without additional and unconventional design, as well as significant cost increases. Furthermore, the recommendations from the USACE/CPRA Southwest Coastal study, as well as local shoring company data, both support this elevation height. For these reasons, and because the elevation project definition also includes additional required freeboard of 2 feet, only elevations up to 14 feet are considered.

11. What is non-residential floodproofing?

Floodproofing projects consist of dry floodproofing techniques, which make buildings watertight up to an established elevation (generally to a maximum of 3 feet flood depths). Dry floodproofing is a viable mitigation option for non-residential buildings and large-scale multi-family structures such as apartments that are too large to be elevated. However, it is not typically feasible in areas of high-velocity flow or wave action. Single family, small multi-family (e.g., duplexes), and manufactured homes are generally not suitable for dry floodproofing measures given the hydrostatic pressures that act on the exterior of the building when water is prevented from entering. In areas where dry floodproofing is not feasible, a structural protection measure, such as constructing a small ring levee or flood wall, may be submitted by parishes and considered by CPRA.

Master Plan Analysis and Development of Nonstructural Projects

12. How are flood depths determined? How are flood depths defined? Does CPRA consider riverine flooding or rainfall estimates in the modeling?

To estimate flood depths, 60 synthetic storms with different intensities, sizes, and landfall locations were modeled to provide an estimate of storm surge across Louisiana's coast. Using this storm surge and wave data along with the relative likelihood of each storm occurring, the CLARA model translates the information into flood depths (defined as the height of the floodwaters or storm surge above grade or ground level) for the current condition, as well as 10, 25, and 50 years in the future. It is important to note that flood depths do not include the possible effects of riverine flooding.

The CLARA model also takes into account the chance of levee/floodwall overtopping and levee/floodwall failure in protected areas using different fragility scenarios. In coastal areas unprotected by levees, floodwalls, or other structures, flood depths are determined by the height of the storm surge plus the height of the highest waves. This does not include any flooding due to rainfall. In areas entirely enclosed by a levee, flood depths include both rainfall and storm surge inundation due to levee overtopping or breaching. This approach is consistent with the USACE LACPR Study (2009).





13. What types of things are included in the assets at risk?

- Residential structures (single family homes, multi-family homes, and manufactured homes)
- Businesses & commercial structures
- Public facilities
- Industrial structures
- Agricultural crops and structures
- Roads, railroads, bridges
- Vehicles

In the 2017 Coastal Master Plan, the assets used to calculate economic damage was based on inventories derived from several sources of data which have been expanded or revised since 2012. **Residential structure data** was obtained from U.S. Army Corps' Louisiana Coastal Protection and Restoration (LACPR) (2008), FEMA Hazus-MH (2009), Greater New Orleans Community Data Center (GNOCDC) (2010), American Community Survey (ACS) (2014); **Non-residential structure data** was obtained from LACPR, FEMA, and the U.S. Census County Business Patterns (CBP) (2005-2008). Additionally, both residential and non-residential structure datasets were updated with more recent and detailed inventory estimates from USACE New Orleans District. These datasets describe individual structures in areas derived for three separate studies including Morganza to the Gulf (MTTG) Reformulation Study, Southwest Coastal Louisiana (SWC) Feasibility Study, and West Shore Lake Pontchartrain Feasibility Study. **Critical assets data** were developed from the Homeland Security Infrastructure Program (HSIP) Gold database (2014) and augmented by an inventory of strategic assets identified by the State of Louisiana.

In addition, previously mitigated structures are also omitted from the assets at risk to avoid duplication of nonstructural investments. Mitigation data was obtained from the Office of Community Development (OCD) and the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP), and included approximated 19,000 structures that had been mitigated from 2005-2014.

14. How is economic damage determined?

Economic damage is determined by the value of assets in a given area and the depth of flooding the assets are subject to. These calculations are based on FEMA's Hazus model, a nationally applicable standardized methodology that contains models for estimating potential economic losses from earthquakes, floods, and hurricanes. Damage is calculated using various depthdamage curves, depending on local conditions, such as fresh versus salt water inundation or flooding in A Zones versus V Zones. In some instances, more locally tailored data is used from the USACE New Orleans District based on historical observed flood damage data in coastal Louisiana.

Economic damage includes the value of assets directly damaged by flooding, as well as repair or replacement costs, and other direct economic impacts, such as cost of evacuation, loss of sales, loss of income, and relocation costs. To determine economic damage over time, flood depths and assets are projected over the next 50 years. Future flood depths respond to a changing landscape, and assets respond to a changing population (which is described in more detail in question #15 below).

Lastly, summaries of economic damage is made using the metric "expected annual damage" (EAD), which quantifies the average amount of damage projected to occur from a storm surge flood event for each community, expressed as dollars of damage for a given year. While every community will not flood every year, these statistical averages at year 50 show a given





community's expected flood risk and the damage that would be associated with that risk as a way to compare the effects of risk reduction projects.

Does the Master Plan consider future population change/growth into its analysis? The 2017 Master Plan considers future population change by taking into account three population scenarios which vary by overall annual coast wide growth rate, as well as different localized growth rates due to differences in population density, land loss rates, and flood depths. The 2017 Coastal Master Plan considers three population scenarios which include: 1) Historic Growth Scenario based on recent historical growth (1990-2000); 2) Concentrated Growth Scenario, which assumes future shifts in population and asset growth to more dense areas that are further upland; and 3) No Growth Scenario, which yields no net growth coast wide and a general population shift away from areas more exposed to land loss and coastal flooding. The population growth scenarios are based on historical development trends, but also reflect the divergent pathways that future growth could take over the 50-year period of analysis. As number and location of assets are generally assumed to be proportionate to population growth, the population scenarios influence plausible future flood damage to better represent future uncertainty and support the comparison of proposed structural and nonstructural risk reduction projects. See section 9.0 from Attachment C3-25 - Storm Surge and Risk Assessment at http://coastal.la.gov/wp-content/uploads/2016/04/Attachment-C3-25-%E2%80%93-Storm-Surge-and-Risk-Assessment June-2016-1.pdf.

16. What are environmental scenarios and how are they used in the plan development process?

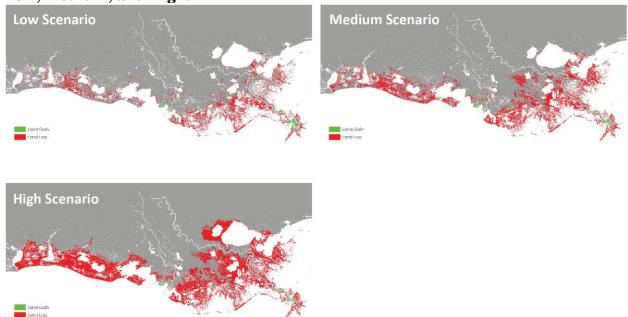
The objective of the master plan is to evaluate and select restoration and protection projects that build and sustain the landscape and reduce risk to communities from storm surge based flooding. Given the uncertainty associated with future environmental conditions, the technical analysis incorporates several environmental scenarios to reflect such uncertainty. These environmental scenarios affect the coastal Louisiana landscape (total land area), flood depths (the height and extent to future storm surge based flooding), and economic damage (the range of economic impacts on buildings and infrastructure due to different flood depths). This is especially important to decision making when planning long-term (50-year), large-scale (coast wide) restoration and protection efforts for coastal Louisiana.

For the 2017 Coastal Master Plan, three environmental scenarios reflect differences in six key environmental drivers considered to have uncertain outcomes over the next 50 years. The three environmental scenarios are Low, Medium, and High, which incorporate different assumptions about eustatic sea level rise (global change in sea level), subsidence (sinking of land), tropical storm intensity, tropical storm frequency, evapotranspiration, and precipitation. The values of these variables included in each scenario represent a range of plausible options based on the best available scientific research, and do not necessarily represent "best-case" or "worst-case" environmental conditions.





Future Without Action Land Change at Year 50 for Three Environmental Scenarios-Low, Medium, and High.



For example, the above maps show future land change if we take no further protection or restoration actions at Year 50 under three different environmental scenarios. (Red indicates areas of land loss and green indicates areas of land gain.) For more information on environmental scenarios, see **Appendix C – Modeling** at http://coastal.la.gov/wp-content/uploads/2016/04/Appendix-C-Ch2_May-2016.pdf

17. What are risk scenarios, and how are they used in the plan development process? A key update for the 2017 Coastal Master Plan analysis was to develop new risk scenarios, which are based on different assumptions about economic growth and the fragility of structural protection systems. Details about economic growth are included in the discussion of assets at risk and population growth scenarios (see questions #13 and #15 above).

Scenarios of levee fragility, or probability of levee structural failure, capture the wide range of uncertainty within protection systems and how they may respond to flood events. The 2017 analysis considers the potential for levee failure through three fragility scenarios to better understand future flood risk and evaluate potential protection projects. Fragility scenarios reflect the probability of levee or floodwall failure due to three failure mechanisms, including seepage, slope stability, and overtopping failure. These scenarios include: 1) No Fragility; 2) IPET Fragility (Interagency Performance Evaluation Task Force, 2007); and 3) MTTG Fragility (Morganza to the Gulf Reformulation Study, 2013); the latter two represent different levee fragility assumptions based on studies conducted by the USACE. See section 4.0 from **Attachment C3-25 – Storm Surge and Risk Assessment** at http://coastal.la.gov/wp-content/uploads/2016/04/Attachment-C3-25-%E2%80%93-Storm-Surge-and-Risk-Assessment June-2016-1.pdf.

18. How are nonstructural projects developed?

For the 2017 Coastal Master Plan, nonstructural project formulation occurs through several steps:

First, 54 candidate nonstructural project areas were created using parish or municipal boundaries as well as current and/or future hurricane protection projects. Within each nonstructural project



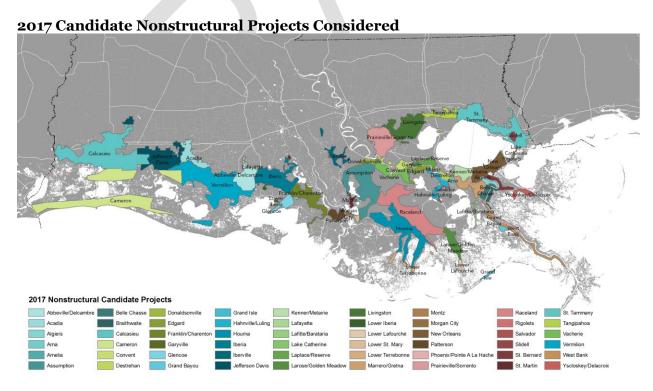




area, several sets of project variations or mitigation options were developed. These project variations (termed "variants") specify the nonstructural mitigation measures (i.e., floodproofing, elevation, and acquisition) that take into consideration different mitigation standards. Mitigation standards correspond to different flood depth conditions as determined by a given time period (initial conditions, year 10, or year 25) and environmental scenario (Low, Medium, and High) that the nonstructural measures are designed to mitigate. For example, a nonstructural project designed to mitigate flood depths for initial conditions may have fewer number of structures recommended for mitigation than a nonstructural project that uses a mitigation standard for flood depths conditions at Year 25 under the High environmental scenario. For each project variant, the number and cost of floodproofing, elevation, and acquisition mitigation options are summarized in total and by structure type. As with structural risk reduction projects, nonstructural project variants are evaluated for their ability to reduce EAD at years 10, 25, and 50, as well as across different environmental and risk scenarios.

After comparing nonstructural project variations to each other, two nonstructural variants were selected. These nonstructural project variants were defined by flood depths occurring at either 1) year 10 or 2) year 25 under the High environmental scenario. Nonstructural projects slated for the initial implementation period (years 1-30) are designed to mitigate the impacts of flood depths occurring 10 years into the future, while nonstructural projects selected in the last implementation period (years 31-50) are designed to mitigate the impacts of flood depths occurring 25 years into the future. Thus, nonstructural projects are designed to mitigate either year 10 flood depths if selected for the first time period, or year 25 flood depths if selected for the last time period.

This group of nonstructural project variants was then analyzed alongside structural protection projects based on different available budget options of \$40, \$50, and \$60 billion for the 2017 Coastal Master Plan (or \$17.6, \$25, and \$30 billion dedicated to risk reduction projects). Projects variants were also compared across different implementation periods as described above.







19. How are risk reduction alternatives developed?

The Planning Tool is a computer program that helps the planning team to compare the relative benefits or drawbacks of hundreds of different risk reduction and restoration project options. These projects can be compared both individually and how they work together in groups (termed "alternatives"). The Planning Tool first compares the benefits of individual risk reduction projects based on their ability to maximize near-term (year 25) and long-term (year 50) EAD reduction. The Planning Tool is then used to develop sets of risk reduction projects, or alternatives, to implement in two time periods (years 1-30 and 31-50) that best achieve CPRA's risk reduction goals. This procedure ensures that the projects that provide the greatest risk reduction (constrained by available funding) are selected in the first time period and those with reduced benefits in the next period. This approach takes into account the significant uncertainty about how precisely the master plan will be implemented over the coming decades, and the importance to implement projects now that will most efficiently put Louisiana on a trajectory of increased resilience.

The Planning Tool is used to identify a robust, adaptive alternative that performs well across many plausible futures. The planning team uses the tool to specify how project selection would change or adapt depending on how the future unfolds. For nonstructural and structural projects, the Planning Tool formulates various alternatives that maximize EAD reduction for different environmental, risk, and funding scenarios. Comparisons of projects across the alternatives are reviewed to identify low-regret projects, or projects that are always selected across the three future environmental scenarios. For more information about the Planning Tool, see the **Appendix D** – **Planning Tool Report** at http://coastal.la.gov/wp-content/uploads/2016/05/CPRA-Appendix-D-Planning-Tool-Methodology_DRAFT.pdf.

20. How are nonstructural projects evaluated?

Nonstructural and structural protection projects are evaluated by how well the project can reduce a given area's EAD within a given budget. Risk regions are used as a common geographic area to compare the effects of nonstructural and structural protection projects. Each of the 54 nonstructural projects is contained within one risk region, while structural projects may impact one or more risk regions.

Effects on EAD are determined by the difference in EAD for a risk region for the "Future with Project" compared against the "Future without Project." Economic damage is generated by the CLARA model for initial conditions and years 10, 25, 50, and across all of the environmental and risk scenarios. Different nonstructural project variants are compared to each other as well as to the structural risk reduction projects to determine which projects provide the greatest risk reduction. In general, all risk reduction projects will be evaluated based on the same risk metric (EAD). Additionally, ten nonstructural projects were identified as prerequisites for structural projects that result in increased flood depths outside the levee system. If one of the seven structural projects that result in induced flooding is recommended in the master plan, the associated prerequisite nonstructural projects would also be recommended to mitigate the area of induced flooding.

21. How is project "cost-effectiveness" determined?

The Planning Tool determines individual projects' cost-effectiveness based on estimates of their effects on the coast scaled by total project cost. For structural and nonstructural protection projects, a project's effect on the coast is measured as the difference between the "Future with Project" and "Future without Project" EAD for a particular area (one or more risk regions) at a point in time. The Planning Tool calculates cost-effectiveness for the mid-term (year 25) and the long-term (year 50). To calculate cost-effectiveness, the effects are scaled using 50-year project





costs, which include planning, design, and construction costs, plus operations and maintenance costs through the 50-year time horizon. As noted in Question 19, EAD reduction is the decision driver used to evaluate the effects of risk reduction projects. The cost-effectiveness metric, while informative, was not used to make decisions about nonstructural project selection.

22. How are nonstructural project cost estimates derived?

The 2017 Coastal Master Plan refines the nonstructural project attributes and cost estimates to aid in evaluating potential flood mitigation projects. In general for floodproofing, elevation, and voluntary acquisition projects, most cost estimates are developed using data and approaches provided in RSMeans® Building Construction Cost Data 2014, 72nd Annual Edition. A Geographic Adjustment Factor is applied to adjust cost based on variable economic conditions in different types of areas (e.g., generally higher labor rates in or near urban areas associated with higher costs of living). These cost estimates are then compared to estimates from local parishes which received recent contractor bids to validate the cost assumptions. For instance, elevation project costs range from \$82-\$104/square foot in the 2017 Coastal Master Plan, while recent project estimates from local parishes show costs ranging from \$55-\$106/square foot.

All nonstructural measures are voluntary in nature, and the anticipated participation rates are a critical component of the evaluation process. While CPRA will make every effort to include as many property owners as possible, past experience indicates that the participation rate will be less than 100%. For the 2017 Coastal Master Plan, an assumed participation rate of 80% is used. For more information on nonstructural project costs, please see **Appendix A: Project Definitions** at http://coastal.la.gov/wp-content/uploads/2016/04/Appendix-A Project-Definitions July-2016.pdf.

23. Are non-federal levees considered in the flood risk reduction analysis (or just federal levees)?

Both federal and non-federal levees are considered within the flood risk assessment, and flood depths reflect any benefits that may (or may not) be afforded by local levees.

24. How do you compare benefits of levees versus nonstructural protection projects? How are nonstructural projects considered alongside structural projects?

As described above, the Planning Tool considers EAD reduction for structural and nonstructural projects together for a particular budget. The Planning Tool assumes additive risk reduction when a nonstructural and structural project affects the same region, with the total risk reduction capped at the amount of risk in the future without action. In other words, the Planning Tool will not count benefits after EAD is eliminated. The Planning Tool selects the structural or nonstructural projects that reduce the most EAD.

The planning team also specifies in certain instances that a structural and nonstructural project pair must be selected together. For example, if a structural project were selected but also increased flood depths outside the levee system, then a nonstructural project would automatically be selected to mitigate the area of induced flooding. It is also possible that some risk regions will not receive a nonstructural or structural project; these would be areas that have relatively low future flood risk, provide minimal risk reduction, or do not fit within the available budget.

25. Does the 2017 Coastal Master Plan give consideration to the needs of low to moderate income families?

Low to moderate Income (LMI) households are 50-80% below the median income level as defined by the United States Department of Housing and Urban Development (HUD). (See https://www.huduser.gov/portal/datasets/il/il16/index il2016.html for more details.) LMI





families may be particularly vulnerable to the impacts of flood risk. As such, LMI was initially considered as an evaluation criterion in the nonstructural project development process. However, requiring households to be LMI to be eligible for mitigation proved to severely limit the scope and size of the nonstructural program, so a LMI criterion was not utilized to make nonstructural project recommendations.

The intent of the master plan is to recommend projects that provide the greatest risk reduction benefit, so restricting the number of structures recommended for mitigation, when those structures are currently at risk but not considered LMI, was not an appropriate step for this coast wide planning level analysis. Nevertheless, CPRA recognizes the challenges of LMI coastal households and will require that parishes target and prioritize LMI properties during the nonstructural implementation process. CPRA will work with parishes to develop a consistent process of prioritizing structures by household income and will offer several options to receive proof of LMI consideration during the application process. For more information of how LMI households are included in the Flood Risk and Resilience Program, please see **Appendix E** – **Flood Risk and Resilience Program Framework.**

26. What are the nonstructural recommendations for the 2017 Draft Coastal Master Plan?

The 2017 Draft Coastal Master Plan includes 32 nonstructural projects that mitigate a total of 26,569 structures at a cost of \$6.06 billion over the next 50 years. This includes 1,412 non-residential floodproofings, 22,716 residential elevations, and 2,416 residential voluntary acquisitions. The 32 recommended nonstructural projects vary in project area size, number and cost of mitigation measures, and other details. A brief overview of how the individual nonstructural projects vary in size and scope includes:

- Cost: \$1 million \$1.6 billion
- Total structures recommended for mitigated: 2 6,097 structures
- Number of non-residential floodproofings recommended: 0 375 structures
- Number of residential elevations recommended: 0 5,307 structures
- Number of residential voluntary acquisitions recommended: 0 889 structures
- Repetitive loss (RL)/severe repetitive loss (SRL) properties included: 0 6,265 structures







For more information about the 2017 Coastal Master Plans' recommended nonstructural projects, see the **Attachment E3 – Nonstructural Project Results**

27. What role do parishes have in nonstructural project implementation? How much flexibility will parishes have in refining CPRA recommendations?

Coastal parishes play a key role in the Flood Risk and Resilience Program and nonstructural mitigation implementation. The Flood Risk and Resilience Program application has been designed with substantial input from parishes, and CPRA and parishes will continue to work closely to develop and implement projects.

It is important to remember that the 2017 Coastal Master Plan's recommended nonstructural projects contain aggregated information for counts of residential elevations, non-residential floodproofing projects, and/or residential voluntary acquisition projects. These counts do not represent mitigations to specific buildings or structures. Parishes are responsible for refining CPRA's nonstructural recommendations by formulating a more detailed list of specific, prioritized structures in order to promote efficient project implementation, effectively reduce flood risk, and tailor the program to the parish's local needs and goals.

To support local decision making, CPRA will provide the parishes with the results of the 2017 Coastal Master Plan nonstructural project evaluation, which contains information on current/future flood risk and identifies the number/type of structures recommended to be mitigated in each project area and the associated project cost estimates. The parishes will then need to determine which specific structures within the project area can be mitigated first with the available funding. Parishes may use information produced from the 2017 Coastal Master Plan nonstructural evaluation process (e.g., future flood risk, EAD, low to moderate (LMI) income areas, severe repetitive loss, etc.) to arrange a prioritization order of implementation for structures, along with other important considerations such as property owner interest. The parish may also include additional evaluation criteria that address parish-specific issues.

Property Owner Questions

28. If I live in an area with a recommended nonstructural project, must I elevate my house?

No, all non-residential floodproofing, residential elevation, and residential acquisition projects are 100% voluntary.

29. Can people participate in the program if they do not have clear title? Are there any resources to help address this challenge?

Homeowners will need to have a clear title to their property if they wish to participate in a voluntary acquisition project. An acquisition project's real estate transaction includes a title search/title insurance to confirm ownership of the parcel. CPRA requires participating properties to have a clear title and will work to assist parishes with obtaining the resources needed to establish ownership to maximize the number of participating homeowners. Resources available to assist homeowners with title issues include:

- Louisiana Appleseed Network (http://appleseednetwork.org/louisiana-appleseed/louisiana/)
- Pro Bono Project (http://probono-no.org/)
- Southeast Louisiana Legal Services (http://slls.org/)
- New Orleans Title Clearing Initiative (https://lawyerscommittee.org/wp-content/uploads/2015/07/Katrina-Report-August-2-2010-Version.pdf





- **30.** If property is sold through voluntary acquisition, can it be resold or redeveloped? Due to the extreme flood depths of properties that are recommended for acquisition, no future development or redevelopment involving residential or non-residential structures or paved surfaces will be allowed on these properties, and the property will be set aside as open space or for other compatible uses. For example, contiguous parcels are excellent candidates for local community parks, recreational areas, or water retention areas.
- 31. If property is sold through voluntary acquisition, can the landowners retain the mineral rights?

Yes. When the State acquires property, the landowner has the right to reserve the mineral rights under La. Mineral Code Article 149. However, such mineral right reservation must be expressly contained in the acquisition deed.

- 32. Where can I get more technical information and learn more about the nonstructural-related details?
 - For more technical details of the 2017 flood risk assessment, please see **Attachment C3-25: Storm Surge and Risk Assessment**: http://coastal.la.gov/wp-content/uploads/2016/04/Attachment-C3-25-%E2%80%93-Storm-Surge-and-Risk-Assessment June-2016-1.pdf
 - For technical details on nonstructural project development process, see Attachment C3-25 noted above and **Appendix D Planning Tool Methodology**: http://coastal.la.gov/wp-content/uploads/2016/05/CPRA-Appendix-D-Planning-Tool-Methodology DRAFT.pdf
 - For technical details on project definitions and cost estimates, see **Appendix A: Project Definitions**: http://coastal.la.gov/wp-content/uploads/2016/04/Appendix-A Project-Definitions July-2016.pdf
 - For technical details on the Flood Risk and Resilience Program and nonstructural projects, see: (forthcoming)
 - o Appendix E Flood Risk and Resilience Program Framework
 - Attachment E1 Flood Risk and Resilience Program Policy Recommendations
 - Attachment E2 Parish Profiles
 - Attachment E3 Nonstructural Model Results
 - Attachment E4 Parish Applicant's Handbook
 - For more information on how the 2017 Master Plan impacts communities, see **Appendix B People and the Landscape** (forthcoming)

Flood Risk and Resilience Program Policy Questions

33. Does CPRA consider community-scale "managed retreat" or relocation?

CPRA's mandate is to develop, implement, and enforce a comprehensive coastal protection and restoration master plan. The 2017 Coastal Master Plan only addresses voluntary residential acquisition, not relocation or managed retreat. CPRA analyzes the number of acquisitions and associated costs proposed for each nonstructural project area. Areas recommended for voluntary residential acquisition in the 2017 Coastal Master Plan are determined by EAD reduction for 100-year flood depths (as modeled by CLARA, 10 or 25 years into the future, under the High environmental scenario). Areas with flood depths over 14 feet (i.e., 12 feet plus two feet of required freeboard) are recommended for voluntary residential acquisition. In all cases, these are general recommendations at a scale of a census block or a 1 x 1 km grid and not recommendations for an individual structure or parcel. Areas that are recommended for voluntary residential acquisition through the Flood Risk and Resilience Program are locations where assets should be removed due





to very high vulnerability and expected flood depths. Additionally, community resettlement or managed retreat is discussed within **Appendix B – People and the Landscape**, which notes any communities that may experience permanent inundation over the next 50 years.

Large-scale community retreat is not a CPRA-only role; many other state, federal, and local agencies will need to work together to consider such plans. The nonstructural and structural risk reduction projects, flood risk data, and policy recommendations developed through the 2017 Coastal Master Plan are just several elements of many that will need to be considered. For instance, the 2017 Coastal Master Plan may provide a better understanding of the potential need for community resettlement and/or locations where conversations about community resettlement may need to happen. To further this collaborative approach, in 2015, CPRA supported OCD by providing flood risk data for the application package for the Isle de Jean Charles Resettlement project, which won a \$48 million grant from HUD. Any community relocation plans should first come from interested residents/communities at the local level.

34. How are nonstructural programmatic measures different than nonstructural projects? How does CPRA support programmatic measures?

Programmatic measures pertain to any activities, not involving physical construction, that use knowledge, practice, or agreement to reduce risks and impacts, in particular through policies and laws, raising public awareness, training, and education. CPRA understands that effectively reducing storm surge flood risk through nonstructural efforts requires the implementation of both physical projects and programmatic measures. Programmatic measures are often implemented through planning or policy initiatives and can include land use planning, hazard mitigation planning, flood ordinances, and building codes. These activities reduce risk to future development within communities, and therefore are integral elements of achieving risk reduction goals across coastal Louisiana. As part of the 2017 Coastal Master Plan, CPRA has developed **Attachment E1** — **Flood Risk and Resilience Program Policy Recommendations**, which describes key policy recommendations that can advance a community's collective ability to reduce flood risk through methods beyond the mitigation of individual structures. The recommendations are categorized into five sections comprising:

- Planning: Comprehensive, Multi-Jurisdictional, Land Use, and Recovery Plans
- Hazard Mitigation Plans
- Regulatory Tools: Local Ordinances, National Flood Insurance Program, and Coastal Zone Management Program
- Infrastructure and Building Standards
- Capital Improvement Plans and Incentives

Within each topic, various recommendations are specifically addressed to a relevant entity that may be best able to enact change including the Louisiana Legislature, other state agencies, parish/municipal governments, and academic/nonprofit groups. The aim is to provide a robust resource of information about the range of pertinent policies and opportunities for action, to frame the Flood Risk and Resilience programmatic recommendations that most urgently need to be addressed, and to generate new ideas about the actionable steps that could be implemented to promote a more resilient coastal Louisiana.

35. How do CPRA's recommendations compare to federal resilience policy recommendations?

CPRA recommends that parishes take into account federal resilience policies, such as Executive Order 13690, when planning for critical facilities. To promote action, CPRA will provide reduced cost share for nonstructural project implementation if a parish meets the below requirement:







- Adopt local policies that focus infrastructure investment and development in areas
 outside of a flood zone, such as policies including a property tax reduction or a higher
 density allowance in low risk areas. When facilities must be located in a flood zone,
 implement the following or similar measures:
 - Require floodproofing of power generation facilities, water/sewage infrastructure, power transmission infrastructure, transportation infrastructure, or other critical facilities.
 - Siting and design of these facilities must take into consideration impacts from climate change, including increasing winds, storm surge, and sea level rise, to protect public and private investment and the welfare and safety of current and future populations.
 - Any new facilities must be built to the 500-year flood elevation to be consistent
 with the standard for critical actions in 44 CFR Part 9 (Floodplain Management
 and Protection of Wetlands) and in anticipation of the requirements of Executive
 Order 13690 (Federal Flood Risk Management Standard).